

Bed Bugs

DHEC does not have the authority or adequate staff to inspect homes or businesses for bed bugs.

DHEC can not force a landlord, hotel, or other business to resolve a bed bug-related problem.

What are bed bugs?

Bed bugs are insects that feed only on blood of humans and other animals. During the day, they typically hide in tiny cracks or crevices and usually feed on a sleeping person at night or in dim lighting.



Adult

Photo: Piotr Naskrecki, CDC Public Health Image Library

Property owners must take aggressive and persistent steps to eliminate bed bugs. Bed bugs reproduce and multiply quickly, which not only causes treatment to become difficult and expensive, but can also ruin the reputation of businesses.

Who gets bed bugs?

Bed bugs infest clean and luxurious homes and businesses just as often as poorly maintained properties. Bed bugs can thrive in a clean environment as long as they can obtain a blood meal from humans or other animals.

Bed bugs are most commonly found in places that house sleeping people and have a high turnover rate for people such as hotels, motels, cruise ships, dormitories, barracks, shelters, apartments, time-share condominiums, prisons, nursing homes, and hospitals.

People transport bed bugs or their eggs to new locations either on themselves or their belongings. Bed Bugs hitchhike to places such as private homes, office buildings, self-service laundries, dry cleaners, schools, movie theatres, thrift stores, high-end clothing stores, furniture rental stores, warehouses, storage facilities, moving vans, trains, buses, airplanes, and ferries.

What is the life cycle of a bed bug?

A female bed bug can lay 3 to 5 eggs per day, but more typically, she will lay 5 to 7 eggs per week and 200-500 eggs during her lifetime. Bed bugs have 3 life stages: eggs, nymphs, and adults. At room temperature (72°F), the transition from egg to adult usually takes about 7 1/2 weeks. Eggs hatch in about 12 days. Nymphs pass through 5 immature stages over about a 6-week period and shed their skins as they grow in size. Adults live 6 to 18 months and can survive up to 1 1/2 years without a blood meal. Early-stage nymphs can only survive several months without a blood meal, but later-stage nymphs can survive over a year without a blood meal.

What do bed bugs look like?

Unfed bed bugs are flattened, tan or brown, oval, and wingless insects. Adult bed bugs are about 1/4 of an inch long and less than 1/8 of an inch wide.

Nymphs look like adult bugs, but are lighter in color and smaller; nymphs range in size from 2/32 inch to 3/16 inch. Light brown molted skins of nymphs can be seen in areas where bed bugs hide. Bed bug eggs are about 1/32 inch and are white.



Nymph (Immature)

Photo: Piotr Naskrecki, CDC Public Health Image Library

Unfed nymphs are yellowish tan, but they turn a bright, crimson red after feeding on blood. Adults turn from brown to a darker reddish or mahogany brown after feeding on blood. Adults and nymphs have short, golden hairs.

How do bed bugs spread from one place to the next?

Bed bugs can crawl throughout a building or be carried by people on themselves, their belongings, or new merchandise. Bed bugs do not fly, but they can crawl fairly rapidly. Bed bugs move through a building by crawling inside of walls along studs, electrical lines, and pipes. Rooms that share a wall, ceiling, or floor with an infested area can become infested. Sources for new infestations might include: (1) Clothing, shoes, luggage, handbags, laptop cases, or backpacks; (2) Furniture and bedding (including mattresses, box springs, and bed frames); (3) Discarded, donated, used, or rented furniture, carpet, fabrics, fixtures, or electrical devices (for example: dumpster, curbside items, yard sales, flea markets, and rental facilities); (4) Storage units; (5) Moving vans, including those used to deliver new furniture; (6) Clean laundry transported in infested vehicles and laundry or housekeeping carts; (7) New or used merchandise shipments; (8) Hair; and (9) Clothing.

How and when do bed bugs feed on blood?

A bed bug pierces the skin with a long beak and injects a substance to numb the skin, making the bite painless. A bug typically spends 3 to 10 minutes feeding.

Once swollen with blood, the bed bug crawls away to a nearby hiding place to digest its meal. Adult bugs will return for a blood meal every 3-5 days, and each of the five immature stages of bed bugs takes at least one blood meal between stages. Bed bugs

typically feed in the dark or dim light, and they are most active from midnight until dawn. However, bed bugs can be seen during the day or in bright light in heavy infestations or if disturbed or driven by hunger because of host unavailability at night.

Do bed bugs cause health problems or transmit diseases?

Although bed bugs have been found naturally infected with various disease-causing agents that survive for varying lengths of time, they are not effective transmitters of disease.

Bed bugs create tremendous stress for people, not only because of bites, but also because treating an infestation can be overwhelming and cause financial hardship. People report anxiety, insomnia, anger, irritability, edginess, short patience, exhaustion, concentration difficulties in concentrating, appetite loss, fear, shame, isolation, depression, and other health problems. People should not feel shame because bed bugs are not related to cleanliness, personal hygiene, personal flaws, income, or social class.

How do people react to bed bug bites?

Bed bug bites can cause skin inflammation due to an allergic reaction to bed bug saliva. Bites can also lead to bacterial infections from excessive scratching. For some sensitive individuals, a life-threatening allergic reaction can occur.



Bites might cause red, swollen, itchy areas similar to mosquito bites, possibly fluid-filled, but the reaction to bites varies from person to person. Welts typically occur in a row on your arms, face, hands, legs, or other parts of your

body that were exposed while you slept.

People react to bed bug bites in one of four ways: (1) No response at all; (2) An immediate reaction within 1 hour to 1 day; (3) A delayed reaction within 2-14 days; or (4) A severe, life-threatening, whole-body allergic reaction (anaphylaxis) that requires immediate professional medical attention.

Individuals that show no reaction or a delayed reaction to bed bug bites might not become aware of an infestation until it has grown much worse.

How do you care for bed bug bites?

Swelling and itching can be relieved by ice or by corticosteroids and antihistamines applied to the skin or taken by mouth. Antiseptics or antibiotic ointments can help prevent secondary bacterial infections. Most of these treatments are available as over-the-counter medications, but prescription-strength varieties might provide more powerful, faster relief. Corticosteroids taken by mouth, such as prednisone, are available only by prescription.

Do bed bugs bite pets?

Bed bugs may feed on dogs, cats, birds or rodents. Two other species related to bed bugs are “bat bugs” and “swallow bugs”; these two species feed on bat and bird blood, but will feed on humans if bats and birds are not around.

What are the signs of a bed bug infestation?

Signs of a bed bug infestation include: (1) Black spots and stains from dried bug feces on the mattress, box spring, bed frame, or a nearby hiding place; (2) Rusty or reddish blood smears on bed sheets or pillowcases; (3) Dead bed bugs; (4) Live bed bugs; (5) Cast-off tan-colored skins of immature bed bugs; (6) White-colored eggs in cracks and crevices; and (7) An obnoxiously musty, sweet, and sickly odor (usually only detectable in heavy infestations).

Where do bed bugs hide?

Bed bugs do not remain attached to people like head or pubic lice. They return to sheltered, hidden sites after a blood meal. Sometimes, they will hitch a ride on a person's hair or clothing.

Bed bugs hide close to where people sleep, usually within about 8 feet. However, sheltered sites can often be as far away as 20 feet, but sometimes as far away as 70 feet.

Their flattened bodies enable them to occupy tiny cracks and crevices on textured or rough, dry surfaces (such as unfinished wood, wicker, or fabric) in dark areas with no air movement.

Where specifically should I look for bed bugs?

Careful inspections require a good flashlight and several hours of time. Consider having the inspection done by a licensed pest control operator who is trained to locate and treat bed bugs.

If bed bugs are found, stop the inspection, and turn your attention to treating the infestation. Disturbing bed bugs will cause them to move from their hiding places and spread into new areas. Hiding places for bed bugs include:

- Mattresses, box springs, bedding, upholstered sofas and chairs, and curtains (look along piping, seams, folds, tufts, rips, buttons, hems, and skirts); in spring coils, cracks and crevices; around tacks and screws; underneath gauze; and inside hollow posts of bed frames or curtain rods
- Carpet edges and underneath carpet tack strips, especially behind beds and furniture
- Nightstands and dressers, unfinished or non-laminated wood (look inside and underneath drawers, underneath furniture, and in cracks, corners, and recesses)
- Along junctions of ceilings and walls (where they meet), baseboards, crown molding, or other molding
- In cracks in walls, ceilings, or floors or under loose wallpaper and dangling bits of chipped paint
- In clutter, amid clothing (especially seams), and inside of hollow clothes hangers
- Under electrical outlet covers and lighting switch plates
- Behind headboards, picture frames, mirrors, etc.
- Inside of electrical devices (televisions, stereos, refrigerators, light fixtures, clocks, phones, smoke detectors, etc.)

How do I get rid of bed bugs?

Eliminating bed bugs is a labor-intensive, time-consuming, and expensive process that involves many treatment methods that are repeated over several weeks or months to ensure that hidden bugs and bugs hatching from eggs are killed.

People who are not pest control professionals will have a difficult time eliminating bed bugs on their own. Strongly consider hiring

a pest control operator who is trained in inspecting and treating bed bugs. A professional will have detailed knowledge of bed bug habits and hiding places and will use a combination of the latest tools, technology, and methods to control bed bugs safely and economically in a strategy known as Integrated Pest Management (IPM). Bed bug-infested areas should be re-inspected every 2 weeks to ensure that bed bugs are completely gone.

Control options that seem to be the most effective when completed at the same time include:

- Prevent the spread of bed bugs. Treat, bag, or wrap all items in plastic before moving them to avoid spreading bed bugs and their eggs to other rooms. Render discarded items unusable by slashing or breaking them to prevent them from being salvaged by others. Tape a sign to discarded infested items that reads, "Infested with Bed Bugs". Never resell or donate infested furniture or other items.
- Wash fabrics or washable items from an infested room in hot water. Seal items in plastic bags before transporting them to the laundry area or Laundromat to prevent spreading bugs or eggs to other rooms. Dissolvable laundry bags will dissolve in hot wash water. A temperature above 140°F will kill eggs and bugs. A temperature of 104°F will kill 70-80% of eggs and all bugs. The Occupational Safety and Health Administration recommends that hot-water tanks be set to 140°F, with water delivered at the faucet at a minimum of 122°F. Most experts recommend that the temperature at the faucet should be around 122-125°F to prevent serious burns. Allow wet clothes to completely dry in a clothes dryer.
- Heat dry items such as clothes, shoes, backpacks, toys, etc. in a clothes dryer. For a full load, dry for 30 minutes; for a few items, dry for 5-20 minutes. A temperature above 175°F will kill all eggs and bugs. The temperature of a normally functioning clothes dryer is 347°F. Most dry-cleanable garments that are already dry can safely be placed in a clothes dryer at a low to medium heat setting (122 to 158°F) with low to no risk of harming the fabric.
- Dry clean non-washable items. The dry-cleaning chemical, perchloroethylene, will kill all stages of bed bugs. Inform the dry cleaner that the items are infested with bed bugs so that dry cleaner staff will use cautionary steps to prevent infesting their establishment.
- Freeze items below 32°F for several days to kill bugs and for 60 days to kill eggs. A typical household frost-free freezer fluctuates between 30 and 39°F.
- Heat items by sealing them in plastic bags or plastic wrap and then placing them outdoors in a sunny location or in a closed vehicle. The temperature inside of the plastic bag or wrap must reach above 104°F for 24 hours to be effective. Packing fewer items per bag makes it harder for the bugs to find cooler places to hide. *This type of treatment might be ineffective for large items such as mattresses that show small changes in internal temperature.*
- Place electrical devices such as stereos, clocks, or telephones in one or more tightly sealed, thick plastic bags with a "No-Pest-Strip" (dichlorovos). Leave items in the bag for at least 2 weeks to kill bugs that emerge from hatching eggs. After treatment, open the bag outside or in a well-ventilated area to prevent breathing insecticidal vapors. Large (65-gram) No-Pest-Strips are labeled for use

in unoccupied areas that have less than 4 hours per day of human exposure.

- Vacuum mattresses, bed frames, furniture, floors, and carpet to quickly reduce the number of live bed bugs. Vacuuming will not completely dislodge eggs that are cemented to surfaces. Use a crack and crevice vacuum tool to suck up bugs hiding in seams or crevices. Avoid brush attachments because bugs and eggs can attach to the bristles.

To keep bed bugs and their eggs from infesting the vacuum cleaner (and spreading the problem throughout a building), follow these steps: (1) Suck up boric acid or diatomaceous earth with the vacuum cleaner; (2) Seal vacuum cleaner bags in sturdy plastic bags before disposal; alternatively, freeze or treat the vacuum cleaner bag with a "No-Pest-Strip" (see above); (3) For bag-less vacuums, wash the canister; (4) Clean the HEPA filter by soaking it in very hot, soapy water for 10 minutes, rinse it, and then let it air dry; (5) Sterilize hoses in very hot water; (6) Store the entire vacuum in a plastic bag when not in use just in case bugs escape and get into the housing of the vacuum cleaner.

- Put encasements labeled as "bed bug proof" or "bite proof" on all mattresses and box springs. An encasement should have a zipper that seals completely to prevent bed bugs from getting in or out of the encasement. Any bed bugs trapped inside will eventually starve. Encasements prevent re-infestation of new, replacement mattresses and allow for easier detection and treatment if a re-infestation should occur. To protect encasements from rips, apply felt strips or duct tape to cover bolts or sharp edges on the bed frame.
- Pull the bed away from walls and other furniture. Keep bedding, including the bed skirt, from touching the floor.
- Monitor for bed bugs by placing each leg of the bed into a moat-style interceptor containing talcum powder to trap bed bugs inside. Using an inner and outer moat will show whether bed bugs are traveling from the floor or from the bed. *Bed bug interceptors are only a monitoring device. Bed bugs can still drop from the ceiling onto the bed.*
- Clear your home of all clutter where bed bugs can hide, or seal clutter in plastic bags or containers. Clutter also can prevent effective treatment of bed bugs by providing the bugs with protective cover from control methods.
- Seal cracks in walls, baseboards, and molding with caulking material. Glue loose wallpaper.
- Use pesticides or strongly consider hiring a licensed pest control operator with experience in treating bed bugs. Inexperienced exterminators can make the problem worse by disturbing and spreading bed bugs without elimination.
- An exterminator might advise treating with one of the following approaches: (1) **Dry steam** — Use dry steam units that produce 5% or less moisture. Move the steam nozzle at a rate of 10-15 seconds per linear foot. The surface must reach 158°-176°F. (2) **Dry heat** — Special heaters are used to heat a building to temperatures high enough to kill bed bugs even inside of walls. Simply raising the thermostat is not effective because high temperatures must be applied suddenly. A gradual rise in temperature will only cause bed bugs to spread into new areas; (3) **Snap freezing** — A machine that sprays carbon dioxide snow (dry ice) from a specially designed nozzle will kill bugs and eggs by rapidly freezing them. (4) **Fumigation** — Fumigation with an invisible

gas is effective at killing all bed bug stages in hidden places. No repeated applications are necessary, and no chemical residue is left behind. (5) **Pesticides** – Some over-the-counter pesticides are not labeled for use on bed bugs. Some over-the-counter pesticides may not kill all bugs, or may act as a repellent, causing bugs to spread. Apply pesticide dusts such as diatomaceous earth, limestone, or silica with pyrethrins in crevices or electrical outlets, but do not use them anywhere that children or pets can reach. Use liquid insecticides for carpet edges and wall/floor intersections. For mattresses or upholstered furniture, pest control professionals only treat seams, tufts, and crevices; the entire upholstered surface is usually not treated. Insecticides used on mattresses or upholstered furniture must be registered by the Environmental Protection Agency for use on upholstered furniture. Most over-the-counter pesticides are not registered for use on upholstered furniture. The pesticide label will specify where the product can be used, but it will not list all of the places where it can not be used.

What bed bug control methods do not work?

- Vacating a room is not effective because bed bugs can survive up to 1 1/2 years without a blood meal. You also risk bringing the bugs with you.
- Bug bombs/foggers do not kill most bed bugs and can cause the bugs to spread to additional rooms.
- Insect repellents are not effective at repelling bed bugs.
- Sleeping with the lights on will not prevent hungry bed bugs from seeking a blood meal.
- Throwing away clothing or items is not necessary if they can be washed in hot water, sufficiently heated in a clothes dryer, or dry cleaned to kill bed bugs and their eggs.
- Boric acid causes insects to dry out, but it mainly works as a stomach poison. Because bed bugs survive on blood only, they would not ingest boric acid.
- Baits designed to control ants and cockroaches do not work for bed bugs because they will not feed on these baits.

How can I protect myself from bed bugs while traveling?

Inspect your hotel room for signs of bed bugs before bringing in your luggage. Either leave your luggage in the car, or place it in the bathtub (bed bugs can not crawl on smooth surfaces).

Pull down the mattress cover or bottom sheet and check for signs of bed bugs along mattress seams, piping, buttons, rips, and labels. Check the headboard and baseboards, too. If you discover bed bugs, request another room, preferably in another section of the building.

Use hard, smooth-surfaced luggage instead of soft-sided, rough-textured luggage. Do not place suitcases, handbags, or dirty clothes on the floor or bed. Keep suitcases and handbags closed, all pockets zipped shut, and/or enclosed in plastic bags.

If you suspect bed bugs during your travel, you should wash, dry, dry clean, or treat items with heat or cold before bringing these infested items into your home. If your luggage was stored with other people's luggage, such as in an airplane, bus, train, ship, or taxi cargo hold, inspect it for signs of bed bugs. At home, keep all suitcases and handbags sealed in plastic bags until you

are ready to use them again. Before using them, inspect them carefully for signs of bed bugs.

How can I prevent bed bugs from infesting my home?

Take precautions while traveling (see above). Do not bring home discarded or abandoned fabrics, luggage, mattresses, beds, or any furniture. Inspect bought, rented, or reconditioned fabrics, luggage, mattresses, beds, or any furniture (for example, from flea markets, yard/garage sales, thrift shops, and rental centers) for signs of bed bugs before placing them in your home.

Be careful when storing furniture in permanent or portable storage units that could possibly be infested with bed bugs. Keep in mind that nearby units could be infested. Be careful when moving furniture in rented vans or vans that deliver new furniture and haul away old, used furniture. These vans could possibly be infested with bed bugs.

How do I get help for bed bugs in South Carolina?

South Carolina has no general laws, regulations, or funding to address bed bug infestations in businesses or homes. Bed bug problems are a private sector responsibility. SC DHEC does not have the authority to solve or intervene in bed bug-related problems except in cases involving state-licensed in-patient healthcare facilities.

Other agencies offer certain kinds of guidance:

- **Pest control or pest control companies** – Consult the Clemson University Department of Pesticide Regulation
- **Housing** – Consult the S.C. Bar Association for concerns with private housing and the U.S. Department of Housing and Urban Development for public (federally subsidized) housing.
- **Businesses** – Consult the S.C. Department of Consumer Affairs for complaints against businesses.